2001

Combining An Online And Problem-based Approach: With Learning As The Common Denominator

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Biography

Roisin Donnelly received the Postgraduate Certificate in Teaching in Higher Education from the University of Ulster at Jordanstown, which led on to her completing the M.Ed. in Professional Development in Higher Education. She has an M.Sc. in Computing and Information Systems and brings 8 years of experience in higher education as a lecturer and researcher in Northern Ireland and Sydney, Australia. She has worked on a number of EU funded projects in Germany and Portugal during her time with the Northern Ireland Knowledge Engineering Laboratory. She is treasurer of the Northern Ireland Expert Systems Group. This is the NI region of the British Computer Society Specialist Group on Expert Systems. It brings together for discussion academics and manufacturing industry people in NI who are interested in Expert (KBS) Systems.

Her teaching and research interests include Computer Assisted Learning and Assessment, Integrating ICTs in to Teaching, Presentation Skills, Active Learning Methods, Online Learning Environments, and Research Methods in HE. She has been working for the last two years in the Learning and Teaching Centre in the Dublin Institute of Technology, primarily in the area of researching and developing online learning environments for higher education.

Abstract

This paper describes the design and delivery of a specialised Online Learning (OL) module in a Postgraduate Diploma in Third Level Learning and Teaching for academic staff at a higher education institute in Ireland. It is designed and delivered online with the WebCT Online Learning Environment using a Problem-based Learning (PBL) approach, with an emphasis on group learning in a real life multi-disciplinary learning environment for the module participants.

The aim of the OL/PBL module is to enable the academic staff participants to become aware of the practicalities of developing, co-ordinating, supporting and evaluating an online course in their own subject discipline; but the key to their success will be by using the principles of PBL to share valuable information with their colleagues in a variety of other disciplines. In addition they have the opportunity to develop a range of online materials in WebCT which will support their proposed online module. These include in the first instance, justifying a decision to deliver a course online rather than by conventional face-to-face methods and conducting a training needs analysis. This is followed by the selection of an appropriate structure and mode of supporting the module for a specific target group and producing a plan for its design, development and evaluation.

Thereafter, they examine how to design appropriate teaching, learning and assessment strategies and develop online learning materials for delivery within the proposed online module. Finally, developing a cost analysis for the production of the specific online module is included. It is felt that throughout, developing the participants' ability to reflect on their own and their students' learning through the maintenance of a reflective log is important.

The OL/PBL module is delivered online via WebCT with appropriate tutor support and face-to face sessions in order that the participants gain the experience of working and learning online, both individually and in a PBL multidisciplinary group.

Introduction

A full international literature review on the relationship between Online Learning and Problem-based Learning was conducted, with the intent to review current research in the two areas. The research has shown that there are a number of instructional strategies that can be well supported through modern interactive learning environments. Whether it be an individual problem presented on CD-ROM or Web-based collaboration, there are many advocates for problem-based learning as a framework for motivating learners and generating high quality learning outcomes:

> *"Problem-based learning is thus particularly suited to assist students towards mastery in a range of generalisable competencies and to support effective adult learning in the cognitive and affective aspects of a course in higher education."* (Engel in Boud and Feletti, 1991).

The main focus of this paper then is to outline the relationship between an Online and Problem-based Learning approach in higher education, with the common thread being the improvement of the student's learning.

The overall impression from the research was that technology-mediated learning can play an important role in the problem-solving process (Hedberg, 2000). This paper examines this role through the design and implementation of a module on a Postgraduate Diploma in Third Level Learning and Teaching for academic staff. The module teaches about online learning and is delivered by online learning; it has been designed and is implemented using a problem-based learning approach for higher education.

The OL/PBL Module

This module is one of eight offered on the Postgraduate Diploma in Third Level Learning and Teaching. The Online Learning Module is taken part-time by academic staff in higher education in Ireland. Attendance and online participation for the module is normally for three hours per week for a duration of ten weeks.

Problem-based Learning is centred on a problem which has to engage students' interest, compel them to take it on as their responsibility, support the development and application of problem-solving and conceptual skills and stimulate self-directed learning into areas of study relevant to the curriculum (Barrows, 1999). Problem-based Learning design is used for this Online Learning Module because it is a motivating way to learn for the participants, as they are involved in active learning, working with real problems in their teaching and what they have to learn in their study is seen as relevant and important.

Pre Induction to Module

In order to ensure that the module participants are comfortable with using the necessary technology and are not experiencing access problems, a pre-induction questionnaire is emailed to them at their email address in the institute. This is used to ascertain whether the participants have access to their own PCs at work or at home, in order for technical support issues to be dealt with. The questionnaire also refers to File management requirements. These are established by asking the participants if they can create, save and manage files on their PC. Some basic Internet skills are determined by asking them if they know how to attach a file to an email message. All these are pre-requisites for starting the online module.

Module Induction

There is a ten week schedule drawn up for the module. The first week is set aside as an Induction Week for the participants to become familiar with the WebCT learning environment and be introduced to the merits of using a Problem-based Learning approach for the module. At the beginning of the Induction Week, the participants are provided with a hard copy of an induction pack that provides practical details for logging onto the WebCT environment. They are asked to complete an Introductory Exercise online, the aim of which is to encourage the module participants to log on to WebCT and ask them to introduce themselves in the Participant Homepages section to their fellow participants. This is to be achieved through personalising their profile online by entering text under these headings: Name, Current Job Description, Previous Experience with Online Technology, and Current Academic Interests.

They are then required to complete an Internet Detective Online Tutorial so that they will be in a position to discuss how to search the web effectively for learning resources.

The full induction session then is conducted face-to-face. It is important for the group to meet each other in this way to assist with the group bonding process that will be so vital when they will be online at a later date. As Problem-based Learning is the learning that results from a group of people working towards the resolution of a real-life problem, it is important for the group to be fully inducted to the PBL tutorial process. They are given a web site on PBL as a reference to start.[1] The information provided on this web site is then reinforced with a presentation and question and answer session at the face-to-face Induction Session.

For the induction to WebCT, the tutors facilitate the participants to go through the relevant aspects of the WebCT course environment in order for them to get logged on to the module and use the facilities in the four main areas of the module, namely the Module Related Resources, Module Information, Discussion Area and the Problem Space.

The Module

The remaining nine weeks of the module consist of synchronous and asynchronous chat sessions, a session using NetMeeting Desktop Video Conferencing Software, full ISDN 6 Video Conferencing sessions, and fixed resources (Online Learning Consultants) giving online or face-to-face assistance to the participants on these areas: a guide to Video Conferencing, a guide to using WebCT facilities and WebCT course prototyping.

Throughout these remaining weeks, the participants work as a PBL group with two real life problems which deal with a number of additional issues. These issues focus

[1] http://www.lgu.ac.uk/deliberations/pbl/index.cgi

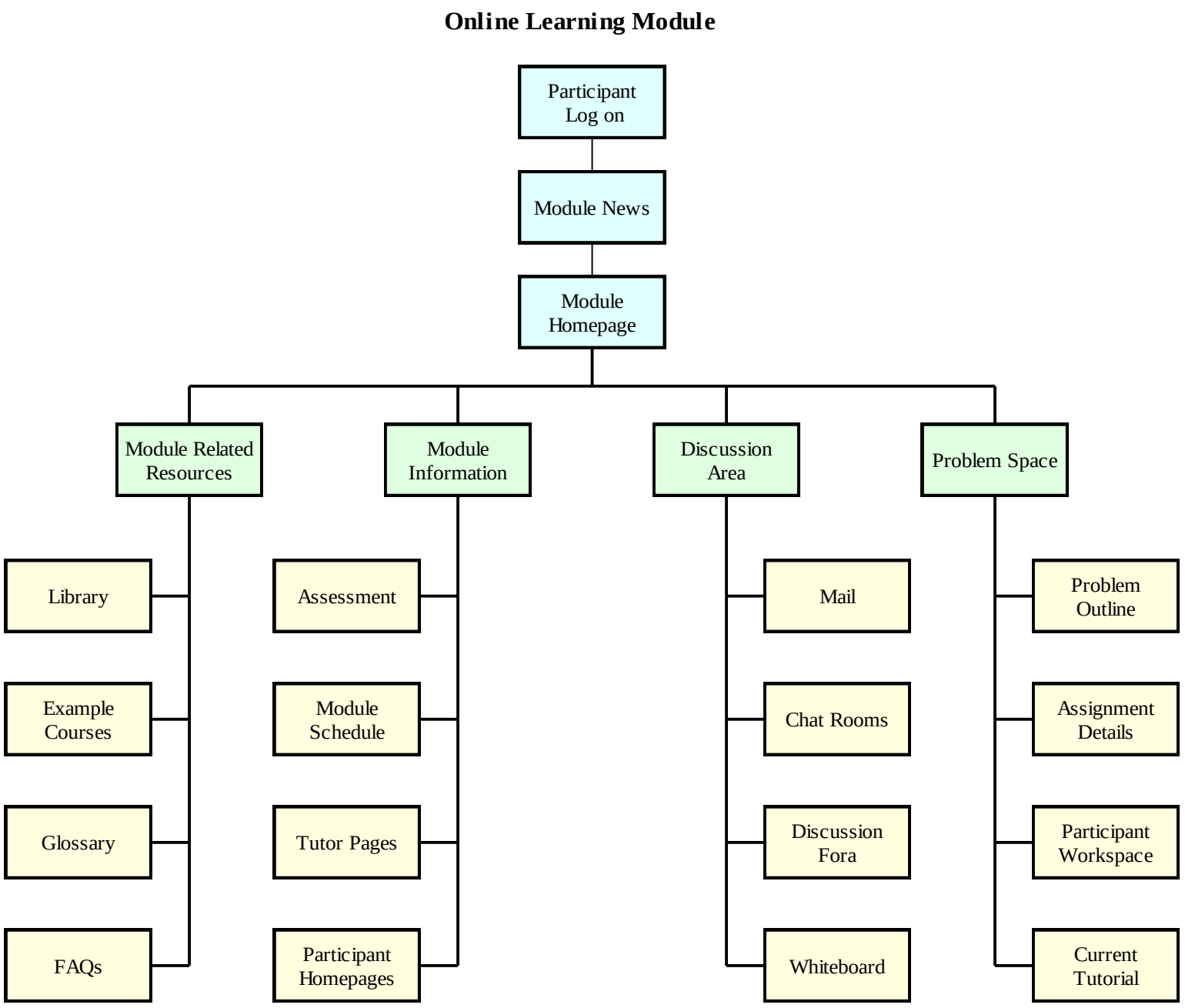
on specifying the roles of tutor and students within an online learning programme, in particular by developing their ability to reflect on their own and their students' learning and producing a student and tutor support strategy for an online course.

From the PBL group perspective, undertaking a range of group roles within an online discussion forum are explored, along with designing online materials which will teach the key skills of developing effective teamwork skills and developing effective and efficient self-directed study skills.

The Assessment for the module is three-fold: a Group Presentation, a Group and an Individual Report. They are designed to demonstrate higher order thinking and problem-solving skills. Memorising facts is not sufficient as this module is designed to achieve deeper approach to learning for the participants: they are following the active learning principle of learning by doing.

Module Design

A top-down design is used for the module in WebCT and icons are developed in the software to reflect this design.



PBL and Collaboration in the Module

Interaction is a critical component of constructivist learning environments, whether via the web or in person, because learning occurs in a social context through collaboration, negotiation, debate, and peer review (Grabinger and Dunlap, 2000).

This module also follows a constructivist perspective, showing that there are three critical components to the online interaction taking place in the module. First, an academic (learner-to-content) component occurs when the participants access online materials and receive task-oriented feedback from the facilitators.

Second, a collaborative (learner-to-learner) component occurs when the participants are engaged in discourse, problem-solving, and product-building using the facilities in the WebCT learning environment. This integration component helps the participants validate their learning experiences, and requires a level of reflective articulation that promotes collective knowledge-building and a deeper personal understanding of what is being studied.

Finally, an interpersonal/social component occurs when the participants receive feedback from the facilitators or their peers in the form of personal encouragement and motivational assistance. Social interaction can contribute to learner satisfaction and frequency of interaction in an online learning environment. Without the opportunity actively to interact and exchange ideas with each other and the facilitator, the participant's social as well as cognitive involvement in the learning environment will be diminished.

Conclusion

For this module, the exciting features offered by the WebCT Online Learning Environment provide a rich environment for learning for the participants. It also provides the infrastructure and communication facilities for them to work collaboratively online in a Problem-based Learning Group, giving them a new experience in higher education in this new millennium.

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Editor's note: This paper is modified from a presentation at the 2001 WebCT conference in Vancouver.